

the application.

Claims 1-11 remain in the application.

Claim 6 stands allowed. See item 7 of the office action mailed February 25, 2003.

Claims 1, 2, 7 and 8 were rejected as being anticipated by U.S. Patent 6,330,083 to Nabeshima. Claims 3-5 and 9-11 were rejected as being obvious over Nabeshima. These rejections are traversed.

A key feature of the present invention is to mount a temperature sensor on the control substrate, which is spaced away from the lamp, and to determine the tube current according to the environmental temperature at the time a manuscript reading operation starts. It is not preferable that an electronic circuit is disposed near the cold cathode lamp, which is activated by high-frequency radio waves, because the electronic circuit is easily affected by high-frequency noises generated from the cold cathode lamp. In order to avoid such a problem, the lamp 2 is disposed close to the reading surface while the control substrate 7 is disposed close to the reading sensor (CCD) 5, as shown in Figure 2. In an example of such a configuration, the substrate on which a temperature sensor is provided, independently of the control substrate, is disposed near the lamp and is connected to control the substrate with cables. However, this configuration leads to increasing the fabrication cost. In contrast, the present invention enables the temperature sensor disposed on the control substrate, so that the configuration is very simplified and the cost increasing factors do not occur.

In the cited reference to Nabeshima, the temperature sensor is attached on or near to the tube wall of a lamp, but is not disposed on the control substrate spaced away from the lamp. Moreover, according the cited reference, the current applied to the lamp is controlled according to an ambient temperature (i.e., the temperature of the tube wall of the lamp) and in a stationary state. However, the current control is not performed according to the ambient temperature at the start time of lighting.

Independent claims 1 and 7 require that the ambient temperature is measured, and require controlling a drive signal based on the detected ambient temperature, where the drive signal controls illumination by the cold-cathode-tube

light source to a level when a document is read. As discussed in the application, the tube current value is controlled while the ambient temperature is being observed so that the luminance upon scanning is controlled to a constant level (see page 13, lines 16-19). The application discusses the thermistor 15 decreasing the voltage of the drive signal c with increasing ambient temperature so that the brightness of the cold-cathode-tube light source 2 is maintained constant (see page 12, lines 21-24 and page 13, lines 3-6). Claims 1, 6 and 7 incorporate these features, and these features are wholly lacking in Nabeshima.

As explained previously, Nabeshima does not measure the “ambient” temperature in the same context as is discussed and claimed in the present invention. Rather, Nabeshima detects the temperature of the lamp tube wall. Even if the tube wall is considered as the ambient, as is suggested by the Examiner (however, it being understood that the applicant does not concede this is a correct interpretation of “ambient” within the context of the present invention), the detected temperature in Nabeshima is not used to control a drive signal which, in turn, controls illumination by the light source equivalent to that which occurs when a document is read. Rather, Nabeshima uses the detected temperature to adjust power to a heater to maintain the lamp at a constant temperature (see Nabeshima at col. 6, lines 21-28). In sharp contrast to the present invention, Nabeshima uses a light detector to provide feedback control for the lamp drive signal (see Nabeshima at col. 6, lines 51-55) instead of using the detected ambient temperature.

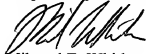
Since this amendment *prima facie* places the application in condition for immediate allowance, it is respectfully requested that the amendment be entered, that claims 1 to 5 and 7 to 11 be allowed together with claim 6, and that the application be passed to issue.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

A provisional petition is hereby made for any extension of time necessary for the continued pendency during the life of this application. Please charge any

fees for such provisional petition and any deficiencies in fees and credit any overpayment of fees to Attorney's Deposit Account No. 50-2041 (Whitham, Curtis & Christofferson, P.C.)

Respectfully submitted,



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1 1. A scanner comprising:
2 a cold-cathode-tube light source for illuminating a surface of a
3 document;
4 a photoelectric conversion element for receiving light reflected from
5 the surface of said document and producing an image signal;
6 a temperature detection circuit for detecting an ambient temperature;
7 a control circuit for controlling a drive signal according to detected
8 ambient temperature, said drive signal controlling illumination by said cold-
9 cathode-tube light source to a level when a document is read.

1 6. A scanner comprising:
2 a cold-cathode-tube light source for illuminating a surface of a
3 document;
4 a photoelectric conversion element for receiving light reflected from
5 the surface of said document and producing an image signal;
6 an impedance detection circuit for detecting an impedance between
7 electrodes of said cold-cathode-tube light source; and
8 a control circuit for controlling a drive signal according to detected
9 impedance information, said drive signal controlling illumination by said
10 cold-cathode-tube light source to a level when a document is read.

1 7. A method of controlling a drive signal for illuminating a cold-cathode-
2 tube light source comprising the steps of:
3 detecting an ambient temperature; and
4 controlling a drive signal based on said detected ambient
5 temperature, said drive signal controlling illumination by said cold-cathode-
6 tube light source to a level when a document is read.